

E 1.28: SOLAR / 1018-79 / 05

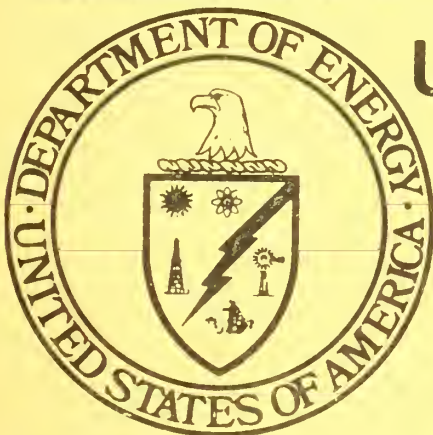
Appt 12/1/79

SOLAR/1018-79/05

# Monthly Performance Report

STEWART-TEELE-MITCHELL

MAY 1979



---

## U.S. Department of Energy

National Solar Heating and  
Cooling Demonstration Program

National Solar Data Program

---

#### NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

## MONTHLY PERFORMANCE REPORT

### STEWART-TEELE-MITCHELL

MAY 1979

#### I. SYSTEM DESCRIPTION

The Stewart-Teele-Mitchell site is a single-family residence in Malta, New York. The home has approximately 1900 square feet of conditioned space. Solar energy is used for space heating the home and preheating domestic hot water (DHW). The solar energy system has an array of flat-plate collectors with a gross area of 432 square feet. The array faces south at an angle of 45 degrees to the horizontal. A glycol/water solution is the transfer medium that delivers solar energy from the collector array to a heat exchanger. Water is then used as the transfer medium that delivers solar energy from the heat exchanger to storage, and to the space heating and DHW loads. Solar energy is stored in the basement in a 1000-gallon insulated tank. Preheated city water is stored in a 75-gallon preheat tank and supplied, on demand, to a conventional 40-gallon DHW tank. When solar energy is insufficient to satisfy the space heating load, an oil-fired furnace provides auxiliary energy for space heating. Similarly, an electrical heating element in the DHW tank provides auxiliary energy for water heating. The system, shown schematically in Figure 1, has five modes of solar operation.

Mode 1 - Collector-to-Storage: This mode activates when the collector temperature exceeds the storage temperature by 20°F and terminates when a temperature difference of 3°F is reached. Solar energy is transferred through the heat exchanger that transmits energy from the solar collection loop to the storage loop. Collector loop pump P1 and storage loop pump P2 are operating.

Mode 2 - Collector-to-Space Heating: This mode activates when mode 1 conditions are satisfied and there is a demand for space heating. The collected solar energy bypasses storage and flows directly to the solar heating coil in the air-handling system. Mode diversion valve V2 is open.

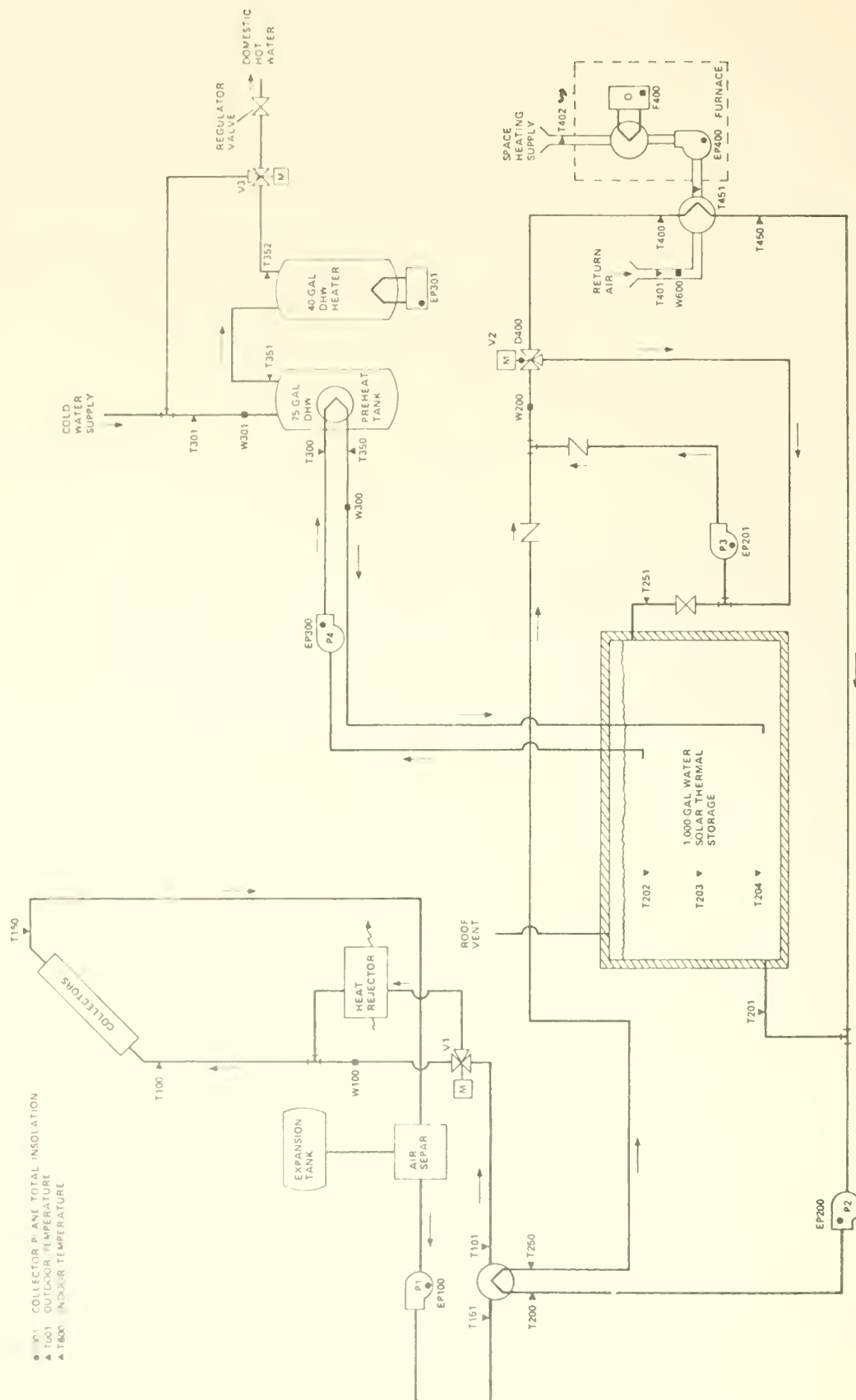


Figure 1. STEWART-TEELE-MITCHELL SOLAR ENERGY SYSTEM SCHEMATIC

Mode 3 - Storage-to-Space Heating: This mode activates when there is a demand for space heating, the temperature at the top of the storage tank exceeds 100°F, and solar energy from the collector is not available. Pump P3 is operating.

Mode 4 - Storage-to-DHW Tank: This mode activates when the temperature at the top of the storage tank exceeds the preheat tank water temperature by 10°F. Pump P4 is operating.

Mode 5 - Summer Mode, Collector-to-Vent: This mode activates when the collector array output fluid temperature exceeds 220°F. The collected solar energy is rejected through a fintube heat exchanger located outside the dwelling. Valve V1 directs the collector loop flow through a purge unit.

## II. PERFORMANCE EVALUATION

### INTRODUCTION

The site was occupied in May and the solar energy system operated continuously during the month. Total solar energy collected was 5.0 million Btu and the total solar energy used was 1.5 million Btu or 30 percent of the collected energy. The stored energy decreased by 0.014 million Btu and the total system losses amounted to 4.0 million Btu. Solar energy satisfied 79 percent of the DHW requirements and 71 percent of the space heating requirements. The solar energy system provided an electrical savings of 0.24 million Btu and a fossil fuel energy savings of 1.1 million Btu.

### WEATHER CONDITIONS

During the month, total incident solar energy on the collector array was 20.3 million Btu for a daily average of 1514 Btu per square foot. This was

above the estimated average daily solar radiation for this geographical area during May of 1398 Btu per square foot for a south-facing plane with a tilt of 45 degrees to the horizontal. The average ambient temperature during May was 60°F as compared with the long-term average for May of 58°F. The number of heating degree-days for the month (based on a 65°F reference) was 187, as compared with the long-term average of 253. The number of cooling degree-days was 35, as compared with the long-term average of 27.

## THERMAL PERFORMANCE

System - During May the solar energy system performed somewhat poorer than expected. The expected performance was determined from a modified f-chart analysis using measured weather and subsystem loads as input. Solar energy used by the system was estimated by assuming that all energy collected would be applied to the load. Actual solar energy used was 1.5 million Btu versus an estimated 2.0 million Btu. System total solar fraction was 74 percent versus an estimated 100 percent.

Digitized by the Internet Archive  
in 2012 with funding from  
University of Florida, George A. Smathers Libraries with support from LYRASIS and the Sloan Foundation

Collector - The total incident solar radiation on the collector array for the month of May was 20.3 million Btu. During the period the collector loop was operating, the total insolation amounted to 15.8 million Btu. The total collected solar energy for the month of May was 5.0 million Btu, resulting in a collector array efficiency of 25 percent, based on total incident insolation. Solar energy delivered from the collector array to storage was 4.3 million Btu, while solar energy delivered from the collector array directly to the loads amounted to 0.023 million Btu. Energy loss during transfer from the collector array to storage and loads was 0.67 million Btu. This loss represented 13 percent of the energy collected. Operating energy required by the collector loop was 0.20 million Btu.

Storage - Solar energy delivered to storage was 4.3 million Btu. There were 1.9 million Btu delivered from storage to the DHW and space heating subsystems.



Energy loss from storage was 2.4 million Btu. This loss represented 56 percent of the energy delivered to storage. The storage efficiency was 44 percent: This is calculated as the ratio of the sum of the energy removed from storage and the change in stored energy, to the energy delivered to storage. The average storage temperature for the month was 133°F.

DHW Load - The DHW subsystem consumed 0.84 million Btu of solar energy and 0.17 million Btu of auxiliary electrical energy to satisfy a hot water load of 0.50 million Btu. The solar fraction of this load was 79 percent. Losses from the DHW subsystem were 0.51 million Btu. The DHW subsystem consumed a total of 0.074 million Btu of operating energy, resulting in an electrical energy savings of 0.46 million Btu. A daily average of 27 gallons of DHW was consumed at an average temperature of 131°F delivered from the tank.

Space Heating Load - The space heating subsystem consumed 0.69 million Btu of solar energy and 0.28 million Btu of auxiliary thermal energy (equivalent to 0.40 million Btu of auxiliary fossil fuel energy) to satisfy a space heating load of 0.96 million Btu. The solar fraction of this load was 71 percent. The space heating subsystem consumed a total of 0.060 million Btu of operating energy, resulting in an electrical energy expense of 0.016 million Btu.

## OBSERVATIONS

A detailed analysis indicates that the solar energy system was capable of satisfying the entire space heating load during May and the entire DHW load for all but four days in May; however, the space heating control system usually activated the oil-fired furnace concurrently with the solar space heating mode. Of the 25 times when solar energy contributed to the space heating load, the oil-fired furnace activated on 14 of those occasions (during mode 3 operation). When the furnace was activated storage temperatures were 141°F, 117°F, 135°F, 125°F, 130°F, 115°F, 125°F, 130°F, 158°F, 138°F, 138°F, 130°F, 113°F, and 117°F. On nine occasions during mode 3 operation, the oil-fired furnace did not activate. Solar storage temperatures were 151°F, 139°F, 133°F, 124°F, 121°F, 120°F, 112°F, 127°F, and 99°F.

The oil-fired furnace did not activate on the two occasions when the solar energy system operated in mode 2. The furnace activated only once when the solar energy system was inactive and the storage temperature at that time was 115°F.

The temperature of the water in the solar preheat tank equalled or exceeded the temperature of the water leaving the conventional electrical (auxiliary) DHW tank every time there was a demand for hot water (for 26 out of 31 days in May); yet, some electrical energy was used to heat DHW on all but five days in May. The design of the DHW subsystem is not compatible with the small hot water demand at this site: Much of the electrical energy used serves only to maintain the temperature of the water in the conventional DHW tank at a preset value which is often below that of the solar-heated water in the preheat tank.

Insufficient data were recorded to permit computation of daily performance during four days in May.

#### ENERGY SAVINGS

The solar energy system provided a net fossil fuel energy savings of 1.1 million Btu and 0.24 million Btu of electrical energy. The DHW subsystem provided an electrical energy savings of 0.46 million Btu, while the space heating subsystem contributed a fossil fuel energy savings of 1.1 million Btu at an electrical energy expense of 0.016 million Btu. The energy collection and storage subsystem incurred an electrical energy expense of 0.20 million Btu.

#### III. ACTION STATUS

Outstanding sensor anomalies are minor, and at present, no site visit is scheduled to correct them.



# SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

## MONTHLY REPORT SITE SUMMARY

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY, 1979

SOLAR/1018-79/05

### SITE/SYSTEM DESCRIPTION:

THE STEWART-TEELE-MITCHELL SOLAR SYSTEM IS INSTALLED IN A 1900 SQ.FT. SINGLE FAMILY DWELLING LOCATED IN MALTA, NY. SOLAR ENERGY IS USED FOR SPACE HEATING AND HOT WATER PREHEATING. THE COLLECTOR ARRAY HEAT TRANSFER FLUID IS 40% GLYCOL/WATER. THE STORAGE AND SOLAR ENERGY DISTRIBUTION FLUID IS WATER. SOLAR ENERGY CAN BE DELIVERED DIRECTLY TO THE LOAD OR TO STORAGE. AUXILIARY SPACE HEATING IS PROVIDED BY AN OIL-FIRED, FORCED AIR FURNACE.

### GENERAL SITE DATA:

INCIDENT SOLAR ENERGY

COLLECTED SOLAR ENERGY

AVERAGE AMBIENT TEMPERATURE  
AVERAGE BUILDING TEMPERATURE  
ECSS SOLAR CONVERSION EFFICIENCY  
ECSS OPERATING ENERGY  
TOTAL SYSTEM OPERATING ENERGY  
TOTAL ENERGY CONSUMED

20.279 MILLION BTU  
46942 BTU/SQ.FT.  
5.017 MILLION BTU  
11613 BTU/SQ.FT.  
60 DEGREES F  
70 DEGREES F  
0.08  
0.202 MILLION BTU  
0.336 MILLION BTU  
5.920 MILLION BTU

### SUBSYSTEM SUMMARY:

LOAD  
SOLAR FRACTION USED  
SOLAR ENERGY USED  
OPERATING ENERGY  
AUX. THERMAL ENERGY  
AUX. ELECTRIC FUEL  
AUX. FOSSIL FUEL  
ELECTRICAL SAVINGS  
FOSSIL SAVINGS

HOT WATER 0.500  
79  
0.841  
0.074  
0.171  
0.171  
N.A.  
0.455  
N.A.  
N.A.

HEATING 0.963  
71  
0.686  
0.060  
0.277  
N.A.  
0.396  
-0.016  
1.144

COOLING N.A.  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.

SYSTEM TOTAL  
1.463 MILLION BTU  
74 PERCENT  
1.527 MILLION BTU  
0.336 MILLION BTU  
0.448 MILLION BTU  
0.171 MILLION BTU  
0.396 MILLION BTU  
0.237 MILLION BTU  
1.144 MILLION BTU

### SYSTEM PERFORMANCE FACTOR:

0.702

\* DENOTES UNAVAILABLE DATA  
@ DENOTES NULL DATA  
N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT  
OF THE NATIONAL SOLAR DATA PROGRAM, FEBRUARY 28, 1978,  
SOLAR/0004-78/18

# SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

## MONTHLY REPORT SITE SUMMARY

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY, 1979

SOLAR/1018-79/05

### SITE/SYSTEM DESCRIPTION:

THE STEWART-TEELE-MITCHELL SOLAR SYSTEM IS INSTALLED IN A 1900 SQ.FT. SINGLE FAMILY DWELLING LOCATED IN MALTA, NY. SOLAR ENERGY IS USED FOR SPACE HEATING AND HOT WATER PREHEATING. THE COLLECTOR ARRAY HEAT TRANSFER FLUID IS 40% GLYCOL/WATER. THE STORAGE AND SOLAR ENERGY DISTRIBUTION FLUID IS WATER. SOLAR ENERGY CAN BE DELIVERED DIRECTLY TO THE LOAD OR TO STORAGE. AUXILIARY SPACE HEATING IS PROVIDED BY AN OIL-FIRED, FORCED AIR FURNACE.

### GENERAL SITE DATA:

INCIDENT SOLAR ENERGY

COLLECTED SOLAR ENERGY

AVERAGE AMBIENT TEMPERATURE

AVERAGE BUILDING TEMPERATURE

ECSS SOLAR CONVERSION EFFICIENCY

ECSS OPERATING ENERGY

TOTAL SYSTEM OPERATING ENERGY

TOTAL ENERGY CONSUMED

21.394 GIGA JOULES  
533071 KJ/SQ.M.  
5.293 GIGA JOULES  
131877 KJ/SQ.M.  
15 DEGREES C  
21 DEGREES C  
0.08 GIGA JOULES  
0.213 GIGA JOULES  
0.354 GIGA JOULES  
6.245 GIGA JOULES

### SUBSYSTEM SUMMARY:

LOAD  
SOLAR FRACTION  
SOLAR ENERGY USED  
OPERATING ENERGY  
AUX. THERMAL ENG  
AUX. ELECTRIC FUEL  
AUX. ECSSIL FUEL  
ELECTRICAL SAVINGS  
ECSSIL SAVINGS

HOT WATER  
0.527  
0.887  
0.078  
0.181  
0.181  
N.A.  
0.480  
N.A.

HEATING  
1.016  
0.724  
0.063  
0.292  
N.A.  
0.417  
-0.017  
1.207

COOLING  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.  
N.A.

SYSTEM TOTAL  
1.544 GIGA JOULES  
74 PERCENT  
1.611 GIGA JOULES  
0.354 GIGA JOULES  
0.473 GIGA JOULES  
0.181 GIGA JOULES  
0.417 GIGA JOULES  
0.250 GIGA JOULES  
1.207 GIGA JOULES

### SYSTEM PERFORMANCE FACTOR:

0.702

\* DENOTES UNAVAILABLE DATA

@ DENOTES NULL DATA

N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT  
OF THE NATIONAL SOLAR DATA PROGRAM, FEBRUARY 28, 1978.  
SOLAR/0004-78/18

# SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

## MONTHLY REPORT ENERGY COLLECTION AND STORAGE SUBSYSTEM (ECSS)

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY, 1979

SOLAR/1018-79/05

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	AMBIENT TEMP DEG-F	ENERGY TC LOADS MILLION BTU	AUX THERMAL TO ECSS MILLION BTU	ECSS OPERATING ENERGY MILLION BTU	ECSS ENERGY REJECTED MILLION BTU	ECSS SOLAR CONVERSION EFFICIENCY
1	0.664	51	0.105	NOT APPLICABLE	0.007	0.000	0.086
2	0.941	51	0.179		0.008	0.000	0.138
3	0.392	55	0.096		0.004	0.000	0.191
4	0.499	53	0.097		0.006	0.000	0.111
5	0.883	49	0.173		0.009	0.000	0.157
6	0.561	50	0.098		0.007	0.000	0.122
7	0.758	57	0.048		0.008	0.000	0.053
8	0.912	68	0.094		0.010	0.000	0.085
9	1.032	79	0.034		0.010	0.000	0.033
10	0.787	77	0.063		0.007	0.000	0.081
11	0.892	71	0.045		0.008	0.000	0.050
12	*	*	*		*	*	*
13	*	*	*		*	*	*
14	0.571	61	0.033		0.008	0.000	0.047
15	0.897	64	0.027		0.009	0.000	0.031
16	0.913	60	0.046		0.007	0.000	0.051
17	0.996	55	0.039		0.008	0.000	0.040
18	0.364	56	0.029		0.002	0.000	0.079
19	*	*	*		*	*	*
20	*	*	*		*	*	*
21	0.411	64	0.021		0.003	0.000	0.052
22	0.773	58	0.026		0.009	0.000	0.034
23	0.289	56	0.039		0.001	0.000	0.093
24	0.072	56	0.027		0.000	0.000	0.312
25	0.180	57	0.132		0.000	0.000	0.478
26	0.647	63	0.025		0.009	0.000	0.039
27	0.451	56	0.049		0.005	0.000	0.064
28	0.701	62	0.083		0.009	0.000	0.080
29	0.684	62	0.030		0.009	0.000	0.044
30	0.454	59	0.021		0.005	0.000	0.047
31	0.939	63	0.031		0.009	0.000	0.033
SUM	20.279	-	1.945	N.A.	0.202	0.000	-
AVG	0.654	60	0.063	N.A.	0.007	0.000	0.075
NBS ID	G001	N113			G102		N111

\* DENOTES UNAVAILABLE DATA.  
 @ DENOTES NULL DATA.  
 N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM  
MONTHLY REPORT  
COLLECTOR ARRAY PERFORMANCE

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY, 1979  
SOLAR/1018-79/05

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU	COLLECTED SOLAR ENERGY MILLION BTU	DAYTIME AMBIENT TEMP DEG F	COLLECTOR ARRAY EFFICIENCY
1	0.664	0.438	0.088	57	0.132
2	0.941	0.832	0.297	60	0.315
3	0.392	0.261	0.069	64	0.176
4	0.495	0.332	0.094	55	0.188
5	0.883	0.793	0.261	55	0.295
6	0.561	0.443	0.129	57	0.230
7	0.758	0.640	0.229	63	0.302
8	0.913	0.818	0.298	78	0.327
9	1.032	0.886	0.297	87	0.288
10	0.787	0.587	0.184	87	0.234
11	0.892	0.732	0.222	82	0.249
12	*	*	*	*	*
13	*	*	*	*	*
14	0.571	0.439	0.117	66	0.205
15	0.897	0.794	0.267	73	0.298
16	0.913	0.720	0.213	67	0.234
17	0.996	0.819	0.246	64	0.247
18	0.364	0.106	0.010	63	0.028
19	*	*	*	*	*
20	*	*	*	*	*
21	0.411	0.194	0.051	71	0.125
22	0.773	0.640	0.194	66	0.251
23	0.289	0.056	0.013	61	0.045
24	0.072	0.000	0.000	*	0.000
25	0.180	0.002	-0.003	57	-0.016
26	0.647	0.572	0.203	70	0.313
27	0.451	0.305	0.090	62	0.200
28	0.701	0.634	0.243	70	0.347
29	0.684	0.592	0.190	66	0.278
30	0.454	0.333	0.093	63	0.205
31	0.939	0.804	0.274	73	0.292
SUM	20.279	15.811	5.017	-	-
AVG	0.654	0.510	0.162	67	0.247
NBSID	Q001		Q100		N100

\* DENOTES UNAVAILABLE DATA.  
@ DENOTES NULL DATA.  
N.A. DENOTES NOT APPLICABLE DATA.



# SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

## MONTHLY REPORT HOT WATER SUBSYSTEM

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY, 1979

SOLAR/1018-79/05

DAY OF MON.	HOT WATER LOAD MILLION BTU	SOLAR FR. OF LOAD PER CENT	SOLAR ENERGY USED MILLION BTU	CPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	SUP. WAT. TEMP DEG F	HOT WAT. TEMP DEG F	HOT WATER USED GAL
1	0.001	26	0.000	0.000	0.002	0.002	NOT	0.001	NOT	60	129	2
2	0.018	56	0.039	0.003	0.008	0.008	NOT	0.015	NOT	60	136	28
3	0.020	83	0.023	0.003	0.003	0.003	NOT	0.020	NOT	59	126	35
4	0.016	75	0.015	0.001	0.009	0.009	NOT	0.014	NOT	58	132	26
5	0.031	73	0.031	0.002	0.012	0.012	NOT	0.028	NOT	60	126	48
6	0.009	71	0.020	0.002	0.005	0.005	NOT	0.006	NOT	54	126	14
7	0.018	72	0.030	0.003	0.008	0.008	NOT	0.014	NOT	58	130	30
8	0.020	72	0.034	0.003	0.008	0.008	NOT	0.017	NOT	58	132	32
9	0.001	72	0.034	0.003	0.003	0.003	NOT	-0.002	NOT	68	129	2
10	0.037	90	0.063	0.004	0.000	0.000	NOT	0.045	NOT	59	131	61
11	0.021	99	0.045	0.002	0.000	0.000	NOT	0.023	NOT	61	134	31
12	*	*	*	*	*	*	NOT	*	NOT	*	*	*
13	*	*	*	*	*	*	NOT	*	NOT	*	*	*
14	0.015	97	0.025	0.001	0.006	0.006	NOT	0.015	NOT	55	140	25
15	0.012	85	0.027	0.004	0.003	0.003	NOT	0.009	NOT	68	131	21
16	0.023	85	0.046	0.003	0.000	0.000	NOT	0.028	NOT	68	122	39
17	0.014	98	0.039	0.002	0.000	0.000	NOT	0.015	NOT	58	130	22
18	0.021	100	0.029	0.002	0.000	0.000	NOT	0.026	NOT	59	132	33
19	*	*	*	*	*	*	NOT	*	NOT	*	*	*
20	*	*	*	*	*	*	NOT	*	NOT	*	*	*
21	0.015	99	0.021	0.001	0.003	0.003	NOT	0.016	NOT	67	129	27
22	0.012	82	0.026	0.002	0.005	0.005	NOT	0.010	NOT	66	134	22
23	0.011	87	0.013	0.001	0.003	0.003	NOT	0.013	NOT	59	126	21
24	0.024	76	0.019	0.001	0.011	0.011	NOT	0.021	NOT	58	130	42
25	0.024	72	0.017	0.001	0.013	0.013	NOT	0.018	NOT	64	130	42
26	0.021	60	0.025	0.004	0.015	0.015	NOT	0.008	NOT	63	133	38
27	0.000	38	0.000	0.000	0.005	0.005	NOT	0.000	NOT	64	134	0
28	0.014	47	0.027	0.002	0.009	0.009	NOT	0.009	NOT	66	135	24
29	0.004	51	0.030	0.004	0.003	0.003	NOT	0.001	NOT	66	134	8
30	0.018	61	0.021	0.002	0.010	0.010	NOT	0.014	NOT	65	139	27
31	0.014	76	0.031	0.003	0.006	0.006	NOT	0.011	NOT	70	132	25
SUM	0.500	-	0.841	0.074	0.171	0.171	N.A.	0.455	N.A.	-	-	833
AVG	0.016	79	0.027	0.002	0.006	0.006	N.A.	0.015	N.A.	62	131	27
NBS	G302	N300	G300	G303	G301	G305	G306	G311	G313	N305	N307	N308

\* DENOTES UNAVAILABLE DATA.  
@ DENOTES NULL DATA.  
N.A. DENOTES NOT APPLICABLE DATA.

# SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

## MONTHLY REPORT SPACE HEATING SUBSYSTEM

SOLAR/1018-79/05

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY. 1979

DAY OF MON.	SPACE HEATING LOAD MILLION BTU	SOLAR FR. OF LOAD PCT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USEC MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	BLDC TEMP DEG. F	AMB TEMP DEG. F
1	0.097	55	0.057	0.004	0.040		0.057	-0.001	0.095	68	51
2	0.110	82	0.090	0.007	0.019		0.028	-0.002	0.151	69	51
3	0.064	81	0.052	0.003	0.012		0.017	-0.001	0.087	69	55
4	0.041	100	0.041	0.004	0.000		0.000	-0.001	0.068	69	53
5	0.136	80	0.108	0.006	0.028		0.039	-0.002	0.180	67	49
6	0.074	66	0.049	0.005	0.025		0.035	-0.001	0.082	68	50
7	0.013	78	0.010	0.001	0.003		0.004	-0.000	0.017	68	57
8	0.044	100	0.044	0.003	0.000		0.000	-0.001	0.073	73	68
9	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	79	79
10	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	79	77
11	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	75	71
12	*	*	*	*	*		*	*	*	*	*
13	*	*	*	*	*		*	*	*	*	*
14	0.011	13	0.001	0.000	0.010		0.014	-0.000	0.002	69	61
15	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	70	64
16	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	69	60
17	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	68	55
18	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	68	56
19	*	*	*	*	*		*	*	*	*	*
20	*	*	*	*	*		*	*	*	*	*
21	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	71	64
22	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	67	58
23	0.050	28	0.014	0.002	0.036		0.052	-0.000	0.023	67	56
24	0.020	18	0.004	0.001	0.016		0.023	-0.000	0.006	68	56
25	0.094	73	0.069	0.010	0.025		0.036	-0.000	0.115	70	57
26	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	68	63
27	0.056	52	0.029	0.003	0.027		0.038	-0.001	0.048	65	56
28	0.029	100	0.029	0.003	0.000		0.000	-0.001	0.049	70	62
29	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	69	59
30	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	68	59
31	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	69	63
SUM	0.963	-	0.686	0.060	0.277	N.A.	0.396	-0.016	1.144	-	-
AVG	0.031	71	0.022	0.002	0.009	N.A.	0.013	-0.001	0.037	70	60
NBS	Q402	N400	Q400	G403	G401		Q410	Q415	Q417	N406	N113

\* DENOTES UNAVAILABLE DATA.  
@ DENOTES NULL DATA.  
N.A. DENOTES NOT APPLICABLE DATA.



# SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

## MONTHLY REPORT ENVIRONMENTAL SUMMARY

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY, 1979

SOLAR/1018-79/05

DAY OF MONTH	TOTAL INSCLATION BTU/SQ.FT	DIFFUSE INSCLATION BTU/SQ.FT	AMBIENT TEMPERATURE DEG F	DAYTIME AMBIENT TEMP DEG F	RELATIVE HUMIDITY PERCENT	WIND DIRECTION DEGREES	WIND SPEED M.P.H.
1	1537	N C T	51	57	N O T	N O T	N O T
2	2178		51	60			
3	908		55	64			
4	1155		53	55			
5	2044		49	55			
6	1299		50	57			
7	1755		57	63			
8	2112		68	78			
9	2388		79	87			
10	1821		77	87			
11	2065		71	82			
12	*		*	*			
13	*		*	*			
14	1321		61	66			
15	2076		64	73			
16	2112		60	67			
17	2306		55	64			
18	843		56	63			
19	*		*	*			
20	*		*	*			
21	951		64	71			
22	1790		58	66			
23	669		56	61			
24	166		56	*			
25	418		57	57			
26	1498		63	70			
27	1043		56	62			
28	1623		62	70			
29	1583		62	66			
30	1050		59	63			
31	2173		63	73			
SUM	46942	N.A.	-	-	-	-	-
AVG	1514	N.A.	60	67	N.A.	N.A.	N.A.
NBS ID	0001		N113			N115	N114

\* DENOTES UNAVAILABLE DATA.  
@ DENOTES NULL DATA.  
N.A. DENOTES NOT APPLICABLE DATA.

# SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

## MONTHLY REPORT STORAGE PERFORMANCE

SITE: STEWART-TEELE-MITCHELL  
REPORT PERIOD: MAY, 1975

SOLAR/1018-79/05

DAY OF MONTH	ENERGY TC MILLION BTU	ENERGY FROM STORAGE MILLION BTU	CHANGE IN STORED ENERGY MILLION BTU	STORAGE AVERAGE TEMP DEG F	STORAGE EFFICIENCY
1	0.038	0.109	-0.175	139	-1.735
2	0.244	0.164	0.020	129	0.755
3	0.060	0.096	-0.073	125	0.375
4	0.072	0.094	-0.067	119	0.370
5	0.242	0.172	0.035	119	0.857
6	0.111	0.098	-0.042	119	0.500
7	0.205	0.048	0.099	120	0.716
8	0.275	0.094	0.107	131	0.731
9	0.260	0.034	0.115	150	0.576
10	0.163	0.063	0.001	156	0.395
11	0.198	0.045	0.048	160	0.465
12	*	*	*	*	*
13	*	*	*	*	*
14	0.078	0.033	-0.153	139	-1.553
15	0.247	0.027	0.102	145	0.526
16	0.174	0.046	0.025	154	0.410
17	0.205	0.039	0.052	160	0.446
18	-0.008	0.029	-0.108	154	9.635
19	*	*	*	*	*
20	*	*	*	*	*
21	0.047	0.021	-0.096	135	-1.596
22	0.162	0.026	0.061	136	0.536
23	0.005	0.039	-0.099	135	-13.276
24	0.000	0.027	-0.063	123	1.000
25	-0.003	0.132	-0.168	105	12.814
26	0.189	0.025	0.119	106	0.763
27	0.082	0.049	-0.019	115	0.356
28	0.228	0.081	0.102	117	0.806
29	0.176	0.030	0.054	129	0.475
30	0.073	0.021	-0.012	130	0.132
31	0.245	0.031	0.124	138	0.632
SUM	4.326	1.922	-0.014	-	-
AVG	0.140	0.062	-0.000	133	0.441
NBS ID	Q200	Q201	Q202		N108

\* DENOTES UNAVAILABLE DATA.

@ DENOTES NULL DATA.

N.A. DENOTES NOT APPLICABLE DATA.





UNIVERSITY OF FLORIDA



3 1262 05392 7454

UNIVERSITY OF FLORIDA



3 1262 09052 5790